

Appl. No. 10/680,306
Resp. dated January ___, 2006
Reply to Office action of November 3, 2005

REMARKS / ARGUMENTS

Claims in the Application

Claims 1 – 32 are active in the present application. The Examiner has rejected claims 1 – 32 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 3,903,738 (“*Malchow*”). In light of the following remarks, Applicant respectfully submits that the active claims of this application are in a condition for Allowance and Notice to that effect is earnestly solicited.

Claim Rejections – 35 U.S.C. § 102

For the convenience of the Examiner and clarity of purpose, Applicant has reprinted the substance of the Office Action in *10-point bolded and italicized font*. Applicant’s arguments immediately follow in regular font.

With respect to claim 1, the Malchow reference teaches a system for mounting an engine comprising a “first and second bearings (i.e. bushings) each connectable to the frame and the engine to form a pivotal axis about which said engine is free to rotate relative to said frame (col. 2 lines 10-20, figure 2), said pivotal axis passing near the center of gravity of the engine and aligned other than orthogonally to the axis of the engine output shaft (figure 2, major principal axis passed through the center of gravity as shown in the figure and is not orthogonal to the output shaft 60), and a load sensing transducer including parts connectable to said frame and said engine for resisting and measuring rotational forces between said engine and said frame about said pivotal axis (col. 2 lines 39-43, one of the front engine mounts is replaced with a force transducer in order to measure torque acting on the engine), said load sensing transducer having an axis of sensitivity on a plane other than any plane which includes the pivotal axis (figures 1 and 2).

The structure disclosed by *Malchow* is significantly different from the structure disclosed and claimed in the subject application. One of the most notable differences is that the subject invention discloses an engine mounting system whereby the pivotal axis of the engine passes near the center of gravity of the engine. This is a critical feature of the subject invention, because configuring the engine mounting system in this manner allows for measurement of engine torque isolated from loads induced by installation misalignments, frame deflections, or acceleration-induced forces. Therefore, the subject invention allows for torque measurement in on-road driving applications, rather than just controlled testing situations.

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Malchow neither discloses nor teaches such an engine mounting system, and as will be explained below, in fact teaches away from such a system. Instead, *Malchow* teaches an engine mounting system in which one of the two traditional front engine mounts is “temporarily” replaced by a torque sensing engine mount. See *Malchow*, col. 2, ll 12-14. Consequently, the pivotal axis of *Malchow* generally passes through the rear engine mount and the traditional front engine mount that is not equipped with a torque sensor.

In order to better understand this important distinction between *Malchow* and the subject invention, it is useful to think about what would happen if the torque sensor of each system was disconnected so that the motor was free to move on a larger scale. With the *Malchow* torque sensing linkage disconnected, the engine would be restrained by the rear engine mount and one of the traditional front engine mounts. Its pivotal axis would be defined by those two points, creating a pivotal axis that passes far from the center of gravity of the engine. By comparison, if the torque sensor of the subject invention was disconnected, the engine would be restrained by the engine mounts in such a way that it would pivot about an axis which passed near the center of gravity of the engine.

For example, regarding the first embodiment disclosed in the subject application, if the lug 11 and load-sensing transducer 12 were removed, the engine would rotate about an axis defined by bushings 4 and 5. This axis passes near or through the center of gravity of the engine. Similarly, in the next disclosed embodiment, if load sensor 48 was removed, the engine would be free to roll on pins 28(a) and 29(a) along the track surface 31 and 31(a) about a pivotal point 20 located on the pivotal axis 17. As in the first disclosed embodiment, this pivotal axis passes near or through the center of gravity of the engine. The same is true for each disclosed embodiment of the subject invention.

Because *Malchow* does not disclose or teach an engine mounting system wherein the pivotal axis of the engine passes near the center of gravity of the engine, claim 1 is patentable. Reconsideration of this rejection is requested.

With respect to claims 2, 10, 18 and 26 the reference teaches, “said load sensing transducer measures rotational forces in only one direction (col. 1 lines 41-43, the force transducer

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measures compressive force not bending force in reaction to engine torque to provide a linear force characteristic of the engine and transmission)."

For the reasons discussed in this Response, Applicant contends that independent claims 1, 9, 17, and 25 are patentable and, therefore, dependent claims 2, 10, 18, and 26 are likewise patentable. Because Applicant has not traversed this rejection on the merits, Applicant does not accede to the accuracy of the Examiner's characterization of *Malchow*. Reconsideration of this rejection is requested.

With respect to claims 3, 11, 19, and 27 the reference teaches, "the first and second bearings are connectable to forward and rearward portions of the frame and engine and are in axial alignment to receive shaft portions on the pivotal axis at opposite ends of the engine (col. 2 lines 22-30, figure 2)."

For the reasons discussed in this Response, Applicant contends that independent claims 1, 9, 17, and 25 are patentable and, therefore, dependent claims 3, 11, 19, and 27 are likewise patentable. Because Applicant has not traversed this rejection on the merits, Applicant does not accede to the accuracy of the Examiner's characterization of *Malchow*. Reconsideration of this rejection is requested.

With respect to claims 4, 12, 20 and 28 the reference teaches, "one of the bearings comprises bearing segments, each connectable to the engine and frame (col. 2 lines 48-53)."

For the reasons discussed in this Response, Applicant contends that independent claims 1, 9, 17, and 25 are patentable and, therefore, dependent claims 4, 12, 20, and 28 are likewise patentable. Because Applicant has not traversed this rejection on the merits, Applicant does not accede to the accuracy of the Examiner's characterization of *Malchow*. Reconsideration of this rejection is requested.

With respect to claims 5, 13, 21, and 29 the reference teaches, "the bearing segments each having a first part guidably moveable with respect to a second part from a pivotal point on the pivotal axis (col. 2 lines 61-67, figure 6, pivot pin 36)."

For the reasons discussed in this Response, Applicant contends that independent claims 1, 9, 17, and 25 are patentable and, therefore, dependent claims 5, 13, 21, and 29 are likewise patentable. Because Applicant has not traversed this rejection on the merits, Applicant does not

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accede to the accuracy of the Examiner's characterization of *Malchow*. Reconsideration of this rejection is requested.

With respect to claims 6, 14, 22, and 30 the reference teaches, "one of said parts contains a rolling element guidably moveable in a slot in the other part (col. 2 lines 61-67, figures 4 and 6)."

For the reasons discussed in this Response, Applicant contends that independent claims 1, 9, 17, and 25 are patentable and, therefore, dependent claims 6, 14, 22, and 30 are likewise patentable. Because Applicant has not traversed this rejection on the merits, Applicant does not accede to the accuracy of the Examiner's characterization of *Malchow*. Reconsideration of this rejection is requested.

With respect to claims 7, 15, 23, and 31 the reference teaches, "the other of said bearings comprises a compliant engine mount (col. 2 lines 10-13, rear mount 18)."

For the reasons discussed in this Response, Applicant contends that independent claims 1, 9, 17, and 25 are patentable and, therefore, dependent claims 7, 15, 23, and 31 are likewise patentable. Because Applicant has not traversed this rejection on the merits, Applicant does not accede to the accuracy of the Examiner's characterization of *Malchow*. Reconsideration of this rejection is requested.

With respect to claims 8, 16, 24, and 32 the reference teaches, "the pivotal axis extends through the center of gravity (figure 2, major principal axis)."

For the reasons discussed in this Response, Applicant contends that independent claims 1, 9, 17, and 25 are patentable and, therefore, dependent claims 8, 16, 24, and 32 are likewise patentable. Because Applicant has not traversed this rejection on the merits, Applicant does not accede to the accuracy of the Examiner's characterization of *Malchow*. Reconsideration of this rejection is requested.

With respect to claim 9, the reference teaches a system for mounting an engine comprising a "first and second bearings (i.e. bushings) each connectable to the frame and the engine to form a pivotal axis about which said engine is free to rotate relative to said frame (col. 2 lines 10-20, figure 2), said pivotal axis aligned other than orthogonally to the axis of the engine output shaft, and so positioned that a conical volume formed by the center of one bearing and the

circle defined by the surfaces of relative motion of the other bearing contains the center of gravity of the engine (figures 1 and 2) and a load sensing transducer including parts connectable to said frame and said engine for resisting and measuring rotational forces between said engine and said frame about said pivotal axis (col. 2 lines 39-43, one of the front engine mounts is replaced with a force transducer in order to measure torque acting on the engine), said load sensing transducer having an axis of sensitivity on a plane other than any plane which includes the pivotal axis (figures 1 and 2)."

As discussed in connection with claim 1 above, Applicant contends that *Malchow* discloses an engine mounting system in which the pivotal axis is defined by the rear engine mount and one of the traditional front engine mounts. The conical volume formed by the center of one of these "bearings" and the circle defined by the surfaces of relative motion of the other "bearing" does not contain the center of gravity of the engine. Therefore, claim 9 is patentable. Reconsideration of this rejection is requested.

With respect to claim 17, the reference teaches a system for mounting an engine comprising a "first and second bearings (i.e. bushings) each connectable to the frame and the engine to form a pivotal axis about which said engine is free to rotate relative to said frame (col. 2 lines 10-20, figure 2), said pivotal axis aligned other than orthogonally to the axis of the engine output shaft (figure 1), and at least one of said bearings having rolling elements between the engine and frame (col. 2 lines 10-20 and lines 25-30, the engine mounts contain rolling elements that provide a roll rate), and a load sensing transducer including parts connectable to said frame and said engine for resisting and measuring rotational forces between said engine and said frame about said pivotal axis (col. 2 lines 39-43, one of the front engine mounts is replaced with a force transducer in order to measure torque acting on the engine), said load sensing transducer having an axis of sensitivity on a plane other than any plane which includes the pivotal axis (figures 1 and 2)."

The elastomeric material of the traditional engine mount of *Malchow* is structurally and functionally different from the "rolling elements" of the subject invention. The track roller assembly 227 of the present invention is a generally cylindrical element designed to allow rolling engagement with the frame component 209(b), and, hence, to allow rolling movement between the engine component 209(a) and frame component 209(b). The elastomeric material of *Malchow*, by contrast, is very different structurally, being of a different shape and material from the rolling elements of the present invention, and is designed to resist engine roll. See *Malchow*, col. 2, ll 28-30.

Because *Malchow* does not disclose or teach an engine mounting system having rolling elements between the engine and frame, claim 17 is patentable. Reconsideration of this rejection

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is requested.

With respect to claim 25, the reference teaches a system for mounting an engine comprising a "first and second bearings (i.e. bushings) each connectable to the frame and the engine to form a pivotal axis about which said engine is free to rotate relative to said frame (col. 2 lines 10-20, figure 2), said pivotal axis aligned other than orthogonally to the axis of the engine output shaft (figure 1), and one of said bearings having a pivotal point outside the space between the surfaces of relative motion of said one bearing (col. 2 lines 61-67, figures 4-6), and a load sensing transducer including parts connectable to said frame and said engine for resisting and measuring rotational forces between said engine and said frame about said pivotal axis (col. 2 lines 39-43, one of the front engine mounts is replaced with a force transducer in order to measure torque acting on the engine), said load sensing transducer having an axis of sensitivity on a plane other than any plane which includes the pivotal axis (figures 1 and 2)."


As discussed in connection with claim 1 above, Applicant contends that *Malchow* discloses an engine mounting system in which the pivotal axis is defined by the rear engine mount and one of the traditional front engine mounts. The pivotal points of each of these "bearings" are not outside the space between the surfaces of relative motion of said "bearing" as required by claim 25. Therefore, claim 25 is patentable. Reconsideration of this rejection is requested.

Conclusion

Applicant thanks the Examiner for his consideration and effort on this matter and submits that this application is now in condition for allowance. Applicant respectfully requests that a timely Notice of Allowance be issued in this case. The undersigned is available to discuss by telephone this amendment or any other matter pertaining to this file

Respectfully submitted,

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